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MODIFIED AMINOPLAST CROSSLINKERS AND POWDER COATING COMPOSITIONS CONTAINING SUCH CROSSLINKERS

This is a DIV of U.S. Patent Application Serial No. 09/918,788 filed 7/31/01 > 6,635,724

CROSS-REFERENCE TO RELATED APPLICATIONS

Reference is made to related U.S. Patent Application Serial Nos.

and

filed concurrently herewith.

10

FIELD OF THE INVENTION

The present invention relates to crosslinking agents based on modified aminoplast resins and to powder coating compositions containing these 15 crosslinking agents.

BACKGROUND OF THE INVENTION

In recent years, powder coatings have become increasingly popular because these coatings are inherently low in volatile organic content ("VOC"), which significantly reduces emissions of volatile organic compounds into the 20 atmosphere during application and curing processes.

Hydroxyl, carboxyl, carbamate, and/or epoxy functional resins, such as acrylic and polyester resins having relatively high glass transition temperatures ("Tg"), are commonly used as main film-forming polymers for these coatings. The relatively high Tg of such polymers provides powder 25 coatings having good storage stability. However when exposed to the extreme temperatures which can be encountered in many geographic areas during shipping and/or storage, even better powder coating stability is desired. By "storage stability" is meant the ability of the individual powder particles which comprise the powder coating to resist the tendency to adhere to one another, thereby causing "clumping" or "fusing" of the powder coating composition 30 upon storage prior to application. Powder coating compositions having very poor storage stability can be difficult, if not impossible, to apply.

Aminoplast resins are well known in the art as low cost crosslinking agents for hydroxyl, carboxyl, and/or carbamate functional polymers in 35 conventional liquid coating compositions. Common aminoplast resins are